

Final

**Site Investigation Report
Former Personnel Decontamination Station
at Building 3185, Parcel 179(7)**

**Fort McClellan
Calhoun County, Alabama**

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See Attachment 1 – List of Abbreviations and Acronyms.

Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK05, IT Corporation completed a site investigation (SI) at the Former Personnel Decontamination Station at Building 3185, Parcel 179(7), at Fort McClellan in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations would present an unacceptable risk to human health or the environment. The SI at the Former Personnel Decontamination (PDS) Station at Building 3185, Parcel 179(7), consisted of the sampling and analyses of five surface soil samples, five subsurface soil samples, and three groundwater samples. In addition, three temporary groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information.

Chemical analyses of samples collected at the Former PDS at Building 3185, Parcel 179(7), indicate that volatile organic compounds and semivolatile organic compounds (SVOC) were detected in the various site media. Chemical agent breakdown products were not detected in the surface soil sample for which these constituents were analyzed. To evaluate whether detected constituents pose an unacceptable risk to human health or the environment, analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for Fort McClellan.

The potential threat to human receptors is expected to be low. Although the site is projected for industrial (mixed business) use, the analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future land use. A total of five SVOCs (polynuclear aromatic hydrocarbons [PAH] compounds) were detected in two surface soil samples at concentrations exceeding SSSLs and PAH background values. The PAH concentrations in the two samples ranged from 0.041 milligrams per kilogram to 8.3 milligrams per kilogram. Based on the spatial distribution and the low concentrations detected, the elevated PAHs appear to be the result of anthropogenic activities (e.g., asphalt) and not related to site operations.

A total of six SVOCs (PAH compounds) were detected in two surface soil samples at concentrations exceeding ESVs and PAH background values. However, the potential impact to ecological receptors is expected to be minimal based on site conditions. Much of the site is

covered by Building 3185 and asphalt or concrete pavement; grassy areas are limited. The site does not currently support viable ecological habitat and is not expected to support ecological habitat in the projected (industrial) land-use scenario.

Based on the results of the SI, past operations at the Former PDS at Building 3185, Parcel 179(7), do not appear to have adversely impacted the environment. The chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. Therefore, IT Corporation recommends “No Further Action” and unrestricted reuse with regard to hazardous, toxic, and radioactive waste at the Former PDS at Building 3185, Parcel 179(7).

1.0 Introduction

The U.S. Army has selected Fort McClellan (FTMC) located in Calhoun County, Alabama, for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The 1990 Base Closure Act, Public Law 101-510, established the process by which U.S. Department of Defense (DOD) installations would be closed or realigned. The BRAC Environmental Restoration Program requires investigation and cleanup of federal properties prior to transfer to the public domain. The U.S. Army is conducting environmental studies of the impact of suspected contaminants at parcels at FTMC under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE contracted with IT Corporation (IT) to perform the site investigation (SI) at the Former Personnel Decontamination Station (PDS) at Building 3185, Parcel 179(7), under Contract Number DACA21-96-D-0018, Task Order CK05.

This SI report presents specific information and results compiled from the SI, including field sampling and analysis and monitoring well installation activities, conducted at the Former PDS at Building 3185, Parcel 179(7).

1.1 Project Description

The Former PDS at Building 3185 was identified as an area to be investigated prior to property transfer. The site was classified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Category 7 sites are areas that are not evaluated and/or that require further evaluation.

A site-specific field sampling plan (SFSP) attachment (IT, 1998a) and a site-specific safety and health plan (SSHP) attachment were finalized in December 1998. The SFSP and SSHP were prepared to provide technical guidance for sample collection and analysis at the Former PDS at Building 3185, Parcel 179(7). The SFSP was used in conjunction with the SSHP as attachments to the installation-wide work plan (IT, 1998b) and the installation-wide sampling and analysis plan (SAP) (IT, 2000a). The SAP includes the installation-wide safety and health plan and quality assurance plan.

The SI included fieldwork to collect five surface soil samples, five subsurface soil samples, and three groundwater samples to determine whether potential site-specific chemicals are present at the site and to provide data useful for supporting any future corrective measures and closure activities.

1.2 Purpose and Objectives

The SI program was designed to collect data from site media and provide a level of defensible data and information in sufficient detail to determine whether chemical constituents are present at the Former PDS at Building 3185, at concentrations that would present an unacceptable risk to human health or the environment. The conclusions of the SI in Chapter 6.0 are based on the comparison of the analytical results to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC. The SSSLs and ESVs were developed by IT as part of the human health and ecological risk evaluations associated with SIs being performed under the BRAC Environmental Restoration Program at FTMC. The SSSLs, ESVs, and polynuclear aromatic hydrocarbon (PAH) background screening values are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). The PAH background screening values were developed by IT at the direction of the BRAC Cleanup Team to address the occurrence of PAH compounds in surface soils as a result of anthropogenic activities at FTMC.

Based on the conclusions presented in this SI report, the BRAC Cleanup Team will decide to propose “No Further Action” at the site or to conduct additional work at the site.

1.3 Site Description and History

The Former PDS at Building 3185 (Parcel 179) is located near the intersection of 25th Street and 13th Avenue in the west-central part of the Main Post (Figures 1-1 and 1-2). The study area around Building 3185 covers 1.7 acres. The PDS was used from about 1954 to 1973 for final decontamination of personnel after completion of training exercises at Naylor Field (Parcel 183[6]), located approximately 1,800 feet to the east along the northeastern slope of Howitzer Hill. The initial decontamination of personnel occurred at Naylor Field, historically called the Howitzer Hill Decontamination Area or T-6 Chemical Area (Parsons Engineering Science, Inc., 1999).

Training exercises at T-6 typically included the use of mustard or distilled mustard, although sarin and lewisite were also used (ESE, 1998). These chemical warfare materials (CWM) were decontaminated using supertropical bleach (STB), decontamination agent noncorrosive, and decontamination solution number 2. Personnel interviewed during the EBS site visit stated that training aids were intentionally contaminated with up to 2 gallons of distilled mustard during each exercise. The training aids consisted of surplus vehicles that had been taken out of service

and dedicated to these decontamination training exercises. After being intentionally contaminated with CWM, the training aid was decontaminated using volumes of decontaminant (STB, decontamination solution number 2, or decontamination agent noncorrosive) well in excess of the volume actually required to achieve complete decontamination. Reportedly, personnel decontamination was also conducted here before trainees left the site; personnel decontamination activities consisted of decontamination of outer garments using water and government-issue soap.

To decontaminate their boots, trainees walked through a shuffle pit filled with the decontaminant STB at the T-6 Chemical Area and another shuffle pit at the PDS (ESE, 1998). At the PDS at Building 3185, trainees repeated the boot decontamination process at this second shuffle pit (also known as Building 3173) located directly behind (south of) Building 3185. Outer garments were decontaminated and/or exchanged inside Building 3185. The disposal of decontamination wastes at Building 3185 is not known. Access to the site is listed as unrestricted although the building is locked.

During a site walkover by IT, ventilation pipes were observed in the vicinity of the building and air locks were observed in the building (Figure 1-2). The purpose of these structures is unknown, however they may have been associated with a negative air pressure system, to prevent airborne contamination from exiting the building.

A tributary of South Branch of Cane Creek is located approximately 300 feet east of the parcel. Surface runoff in the vicinity of the site follows site topography and generally flows to the northeast towards South Branch of Cane Creek. Site elevation ranges from approximately 810 to approximately 825 feet above mean sea level. Figure 1-2 shows topographic features and site boundaries.

2.0 Previous Investigations

An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with DOD guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
2. Areas where only release or disposal of petroleum products has occurred
3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken
6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented
7. Areas that are not evaluated or require additional evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, the Alabama Department of Environmental Management (ADEM), the U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC

employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

The Former PDS at Building 3185 was identified as a CERFA Category 7 site: areas that are not evaluated or require additional evaluation.

3.0 Current Site Investigation Activities

This chapter summarizes SI activities conducted by IT at the Former PDS at Building 3185, Parcel 179(7), including environmental sampling and analysis and groundwater monitoring well installation activities.

3.1 Environmental Sampling

The environmental sampling performed during the SI at the Former PDS at Building 3185 included the collection of surface and subsurface soil samples and groundwater samples for chemical analyses. The sample locations were determined by observing site physical characteristics noted during a site walkover and by reviewing historical documents pertaining to activities conducted at the site. The sample locations, media, and rationale are summarized in Table 3-1. Sampling locations are shown on Figure 3-1. Samples were submitted for laboratory analyses of site-related parameters listed in Section 3.3.

3.1.1 Surface Soil Sampling

Surface soil samples were collected from five locations at the Former PDS at Building 3185, Parcel 179(7), as shown on Figure 3-1. Soil sampling locations and rationale are presented in Table 3-1. Sample designations and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Soil sampling locations were determined in the field by the on-site geologist based on the sampling rationale, presence of surface structures, site topography, and buried utilities.

Sample Collection. Surface soil samples were collected from the upper 1 foot of soil with a 3-inch diameter stainless-steel hand auger using the methodology specified in Section 4.9.1.1 of the SAP (IT, 2000a). Surface soil samples were collected by first removing surface debris, such as fill material or vegetation, from the immediate sample area. The soil was then collected with the sampling device and screened with a photoionization detector (PID) in accordance with Section 4.7.1.1 of the SAP (IT, 2000a). Samples for volatile organic compound (VOC) analyses were collected directly from the sampler using three EnCore[®] samplers. The remaining soil was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3. Sample collection logs are included in Appendix A.

Table 3-1

**Sampling Locations and Rationale
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Media Sampled	Sample Location Rationale
PPMP-179-GP01	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected near the northwest entrance (air lock doors) to Building 3185. This sampling location has the potential for deposition and infiltration of contaminants to the surface or subsurface soil.
PPMP-179-GP02	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected near the northeast entrance (air lock doors) to Building 3185. This sampling location has the potential for deposition and infiltration of contaminants to the surface or subsurface soil and eventually to groundwater.
PPMP-179-GP03	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected near the southwest entrance (air lock doors) to Building 3185. This sampling location has the potential for deposition and infiltration of contaminants to the surface or subsurface soil.
PPMP-179-GP04	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected downgradient (east-northeast) of the shuffle pit (also known as Building 3173). This sampling location will indicate if any migration from the shuffle pit has taken place.
PPMP-179-GP05	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected just west of the shuffle pit located south of Building 3185.

Table 3-2

**Surface and Subsurface Soil Sample Designations and QA/QC Samples
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-179-GP01	PPMP-179-GP01-SS-KH0001-REG	0-1			PPMP-179-GP01-SS-KH0001-MS	TCL VOCs, TCL SVOCs
	PPMP-179-GP01-DS-KH0002-REG	6-9			PPMP-179-GP01-SS-KH0001-MSD	
PPMP-179-GP02	PPMP-179-GP02-SS-KH0003-REG	0-1				TCL VOCs, TCL SVOCs
	PPMP-179-GP02-DS-KH0004-REG	3-4.5				
PPMP-179-GP03	PPMP-179-GP03-SS-KH0005-REG	0-1				TCL VOCs, TCL SVOCs
	PPMP-179-GP03-DS-KH0006-REG	6-9				
PPMP-179-GP04	PPMP-179-GP04-SS-KH0007-REG	0-1	PPMP-179-GP04-SS-KH0008-FD	PPMP-179-GP04-SS-KH0009-FS		TCL VOCs, TCL SVOCs
	PPMP-179-GP04-DS-KH0010-REG	2-4				
PPMP-179-GP05	PPMP-179-GP05-SS-KH0011-REG	0-1				TCL VOCs, TCL SVOCs, CWM Breakdown Products*
	PPMP-179-GP05-DS-KH0012-REG	3-5				

* Surface soil sample only (sample number KH0011).

CWM - Chemical warfare material.

FD - Field duplicate.

FS - Field split.

ft. bgs - feet below ground surface.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TCL - Target compound list.

VOC - Volatile organic compound.

3.1.2 Subsurface Soil Sampling

Subsurface soil samples were collected from five soil borings at the Former PDS at Building 3185. Subsurface soil sampling locations and rationale are presented in Table 3-1. Subsurface soil sample designations, depths, and QA/QC samples are listed in Table 3-2. Soil boring sampling locations were determined in the field by the on-site geologist based on the sampling rationale, presence of surface structures, site topography, and buried and overhead utilities. IT contracted TEG, Inc., a direct-push technology subcontractor, to assist in subsurface soil sample collection.

Sample Collection. Subsurface soil samples were collected from soil borings at depths greater than 1 foot below ground surface (bgs) in the unsaturated zone. The soil borings were advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.9.1.1 of the SAP (IT, 2000a). Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3.

Subsurface soil samples were collected continuously until direct-push sampler refusal was encountered. Samples were field screened using a PID in accordance with Section 4.7.1.1 of the SAP (IT, 2000a) to measure for volatile organic vapors. The soil sample displaying the highest reading was selected and sent to the laboratory for analysis; however, at those locations where PID readings were not greater than background, the deepest soil sample interval above the saturated zone was submitted for analyses. Samples to be analyzed for VOCs were collected directly from the acetate liner using three EnCore[®] samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. Samples submitted for laboratory analyses are summarized in Table 3-2. The on-site geologist constructed a detailed boring log for each soil boring. The lithological log for each borehole is included in Appendix B.

At the completion of soil sampling, boreholes were abandoned with hydrated bentonite chips following borehole abandonment procedures summarized in Appendix B of the SAP (IT, 2000a).

3.1.3 Well Installation

Three temporary wells were installed in the residuum groundwater zone at the Former PDS at Building 3185 to collect groundwater samples for laboratory analyses. The temporary

well/groundwater sample locations are shown on Figure 3-1. Table 3-3 summarizes construction details of the wells installed at the site. The well construction logs are included in Appendix B.

IT contracted Miller Drilling, Inc., to install the temporary wells with a hollow-stem auger rig at the locations shown on Figure 3-1. IT installed the temporary wells at the locations where direct-push soil samples were collected. The wells were installed following procedures outlined in Section 4.7 and Appendix C of the SAP (IT, 2000a). The boreholes at these locations were advanced with a 4.25-inch inside diameter (ID) hollow-stem auger from ground surface to the first water-bearing zone in residuum at the well location. The borehole was augered to the depth of direct-push sampler refusal and samples were collected at the depth of direct-push refusal to the bottom of the borehole. A 2-foot long, 2-inch ID carbon steel split-spoon sampler was driven at 5-foot intervals to collect residuum for observing and describing lithology. Where split-spoon refusal was encountered, the auger was advanced until the first water-bearing zone was encountered. The on-site geologist logging the auger boreholes at the DRMO Area, Parcel 85(7), continued the lithological log for each borehole from the depth of split-spoon refusal to the bottom of the auger borehole by logging the auger drill cuttings. The drill cuttings were logged to determine lithologic changes and the approximate depth of groundwater encountered during drilling. This information was used to determine the optimal placement of the monitoring well screen interval and to provide site-specific geological and hydrogeologic information. The lithological log for each borehole is included in Appendix B.

Upon reaching the target depth, a 15-foot length of 2-inch ID, 0.010-inch factory slotted, Schedule 40 polyvinyl chloride (PVC) screen with a 3-inch PVC end cap was placed through the auger to the bottom of the borehole. The screen and end cap were attached to 2-inch ID, flush-threaded Schedule 40 PVC riser. A filter pack consisting of number 1 filter sand (environmentally safe, clean fine sand, sieve size 20 to 40) was tremied around the well screen to approximately 2 feet above the top of the well screen as the augers were removed. The wells were surged approximately 10 minutes using a solid PVC surge block, or until no more settling of the filter sand occurred inside the borehole. A bentonite seal, consisting of approximately 2 feet of bentonite chips, was placed immediately on top of the filter pack and hydrated with potable water. If the bentonite seal was installed below the water table surface, the bentonite chips were allowed to hydrate in the groundwater. Bentonite seal placement and hydration followed procedures in Appendix C of the SAP (IT, 2000a). A locking well cap was placed on the PVC well casing. The temporary well surface completion included attaching plastic sheeting

Table 3-3

**Temporary Well Construction Summary
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama**

Temporary Well	Northing	Easting	Ground Elevation (ft msl)	TOC Elevation (ft msl)	Well Depth (ft bgs)	Screen Length (ft)	Screen Interval (ft bgs)	Well Material
PPMP-179-GP02	1166293.37	668538.99	815.10	815.95	29	15	13.75 - 28.75	2" ID Sch. 40 PVC
PPMP-179-GP04	1166030.61	668586.55	819.47	820.71	29	15	13.75 - 28.75	2" ID Sch. 40 PVC
PPMP-179-GP05	1166013.49	668502.75	821.70	823.11	24	15	8.75 - 23.75	2" ID Sch. 40 PVC

Temporary wells installed using hollow-stem auger.

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983.

Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

2" ID Sch. 40 PVC - 2-inch inside diameter, Schedule 40, polyvinyl chloride.

bgs - Below ground surface.

ft - Feet

msl - Mean sea level.

TOC - Top of casing.

around the PVC riser using duct tape. Additionally, sandbags were used to secure the sheeting to the ground surface around the temporary well.

The temporary wells were developed by surging and pumping with a submersible pump in accordance with methodology outlined in Section 4.8 and Appendix C of the SAP (IT, 2000a). The submersible pump being used for well development was moved in an up-and-down fashion to encourage any residual well installation materials to enter the well. These materials were then pumped out of the well in order to re-establish the natural hydraulic flow conditions. Development continued until the water turbidity was equal to or less than 20 nephelometric turbidity units or for a maximum of 4 hours. The well development logs are included in Appendix C.

3.1.4 Water Level Measurements

The depth to groundwater was measured in the temporary wells installed at the Former PDS at Building 3185 in March 2000 following procedures outlined in Section 4.18 of the SAP (IT, 2000a). Depth to groundwater was measured with an electronic water level meter. The meter probe and cable were cleaned between use at each well following decontamination methodology presented in Section 4.10 of the SAP (IT, 2000a). Measurements were referenced to the top of the PVC casing. A summary of groundwater level measurements is presented in Table 3-4.

3.1.5 Groundwater Sampling

Groundwater was sampled from the three temporary wells installed at the Former PDS at Building 3185. The well/groundwater sampling locations are shown on Figure 3-1. The groundwater sampling locations and rationale are listed in Table 3-1. The groundwater sample designations and QA/QC samples are listed in Table 3-5.

Sample Collection. Groundwater sampling was performed following procedures outlined in Section 4.9.1.4 of the SAP (IT, 2000a). Groundwater was sampled after purging a minimum of three well volumes and after field parameters, including temperature, pH, specific conductivity, oxidation-reduction potential, and turbidity, stabilized. Purging and sampling were performed with a submersible pump equipped with Teflon[™] tubing at PPMP-179-GP04 and PPMP-179-GP05. PPMP-179-GP02 was purged dry with the submersible pump after 5 well volumes were removed. A Teflon[™] bailer was subsequently used at PPMP-179-GP02 to collect the groundwater sample. Groundwater field parameters were measured after the completion of purging and prior to sample collection using a calibrated water quality meter. Field parameter

Table 3-4

**Groundwater Elevations
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama**

Temporary Well Location	Date	Depth to Water (ft BTOC)	Ground Elevation (ft msl)	Top of Casing Elevation (ft msl)	Groundwater Elevation (ft msl)
PPMP-179-GP02	14-Mar-00	15.15	815.10	815.95	800.80
PPMP-179-GP04	14-Mar-00	18.44	819.47	820.71	802.27
PPMP-179-GP05	14-Mar-00	13.77	821.70	823.11	809.34

Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

BTOC - Below top of casing.

ft - Feet.

msl - Mean sea level.

Table 3-5

**Groundwater Sample Designations and QA/QC Samples
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	QA/QC Samples			Analytical Suite
		Field Duplicates	Field Splits	MS/MSD	
PPMP-179-GP02	PPMP-179-GP02-GW-KH3001-REG	PPMP-179-GP02-GW-KH3002-FD	PPMP-179-GP02-GW-KH3003-FS		TCL VOCs, TCL SVOCs
PPMP-179-GP04	PPMP-179-GP04-GW-KH3004-REG			PPMP-179-GP04-GW-KH3004-MS PPMP-179-GP04-GW-KH3004-MSD	TCL VOCs, TCL SVOCs
PPMP-179-GP05	PPMP-179-GP05-GW-KH3005-REG				TCL VOCs, TCL SVOCs

Groundwater samples were collected from the approximate midpoint of the saturated screened interval of the monitoring well.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TCL - Target compound list.

VOC - Volatile organic compound.

readings are summarized in Table 3-6. Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-5 using methods outlined in Section 3.3.

3.2 Surveying of Sample Locations

Sample locations were surveyed using global positioning system survey techniques described in Section 4.3 of the SAP (IT, 2000a), and conventional civil survey techniques described in Section 4.19 of the SAP (IT, 2000a). Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix D.

3.3 Analytical Program

Samples collected during the SI were analyzed for various chemical parameters. The specific suite of analyses performed was based on the potential site-specific chemicals historically at the site and EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected at the Former PDS at Building 3185 included the following parameters:

- Target compound list VOCs - EPA Method 5035/8260B
- Target compound list semivolatile organic compounds (SVOC) - EPA Method 8270C.

In addition, the surface soil sample collected at PPMP-179-GP05 was analyzed for CWM breakdown products using EPA Methods 8270M and 8321M.

The samples were analyzed using EPA SW-846 methods, including Update III methods where applicable, as presented in Table 6-1 in Appendix B of the SAP (IT, 2000a). Data were reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of Appendix B of the SAP [IT, 2000a]). Chemical data were reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages were validated in accordance with EPA National Functional Guidelines by Level III criteria. A summary of validated data is included in Appendix E. The Data Validation Summary Report is included as Appendix F.

3.4 Sample Preservation, Packaging, and Shipping

Table 3-6

**Groundwater Field Parameters
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Date	Media	Specific Conductivity (mS/cm)^a	Dissolved Oxygen (mg/L)	ORP (mV)	Temperature (°C)	Turbidity (NTU)	pH (SU)
PPMP-179-GP02	23-Feb-99	GW	0.313	10.50	198.7	12.68	190.2	7.44
PPMP-179-GP04	23-Feb-99	GW	0.031	8.36	244.6	16.77	37.2	5.35
PPMP-179-GP05	23-Feb-99	GW	0.085	6.87	223.1	16.08	119.6	5.87

^a Specific conductivity values standardized to millisiemens per centimeter.

°C - Degrees Celsius.

GW - Groundwater.

mg/L - Milligrams per liter.

mS/cm - Millisiemens per centimeter.

mV - Millivolts.

NTU - Nephelometric turbidity unit.

ORP - Oxidation-reduction potential.

SU - Standard units.

Sample preservation, packaging, and shipping followed requirements specified in Section 4.13.2 of the SAP (IT, 2000a). Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SI are listed in Chapter 5.0, Table 5-1, of Appendix B of the SAP (IT, 2000a). Sample documentation and chain-of-custody records as specified in Section 4.13 of the SAP (IT, 2000a).

Completed analysis request and chain-of-custody records (Appendix A) were secured and included with each shipment of sample coolers to Quanterra Environmental Services in Knoxville, Tennessee. Split samples were shipped to USACE South Atlantic Division Laboratory in Marietta, Georgia.

3.5 Investigation-Derived Waste Management and Disposal

Investigation-derived waste (IDW) was managed and disposed as outlined in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI at the Former PDS at Building 3185, Parcel 179(7), was segregated as follows:

- Drill cuttings
- Purge water from well development and sampling activities, and decontamination fluids
- Personal protective equipment.

Solid IDW was stored inside the fenced area surrounding Buildings 335 and 336 in lined roll-off bins prior to characterization and final disposal. Solid IDW was characterized using toxicity characteristic leaching procedure analyses. Based on the results, drill cuttings and personal protective equipment generated during the SI were disposed as nonregulated waste at the Industrial Waste Landfill on the Main Post of FTMC.

Liquid IDW was contained in the existing 20,000-gallon sump associated with the Building T-338 vehicle washrack. Liquid IDW was characterized by VOC and SVOC analyses. Based on the analyses, liquid IDW was discharged as nonregulated waste to the FTMC wastewater treatment plant on the Main Post.

3.6 Variances/Nonconformances

There were not any variances or nonconformances to the SFSP recorded during completion of the

SI at the Former PDS at Building 3185, Parcel 179(7).

3.7 Data Quality

The field sample analytical data are presented in tabular form in Appendix E. The field samples were collected, documented, handled, analyzed, and reported in a manner consistent with the SI work plan; the FTMC SAP and quality assurance plan; and standard, accepted methods and procedures. Sample collection logs pertaining to the collection of these samples were reviewed and organized for this report and are included in Appendix A.

Data Validation. A complete (100 percent) Level III data validation effort was performed on the reported analytical data. Appendix F consists of a data validation summary report that was prepared to discuss the results of the validation. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC IT Environmental Management SystemTM database for tracking and reporting. The qualified data were used in the comparison to the SSSLs and ESVs. Rejected data (assigned an “R” qualifier) were not used in the comparison to the SSSLs and ESVs.

The data presented in this report, except where qualified, meet the principle data quality objective for this SI.

4.0 Site Characterization

Subsurface investigations performed at the Former PDS at Building 3185, Parcel 179(7), provided soil and groundwater data used to characterize the geology and hydrogeology of the site.

4.1 Regional and Site Geology

4.1.1 Regional Geology

Calhoun County includes parts of two physiographic provinces, the Piedmont Upland Province and the Valley and Ridge Province. The Piedmont Upland Province occupies the extreme eastern and southeastern portions of the county and is characterized by metamorphosed sedimentary rocks. The generally accepted range in age of these metamorphics is Cambrian to Devonian.

The majority of Calhoun County, including the Main Post of FTMC, lies within the Appalachian fold and thrust structural belt (Valley and Ridge Province) where southeastward-dipping thrust faults with associated minor folding are the predominant structural features. The fold and thrust belt consists of Paleozoic sedimentary rocks that have been asymmetrically folded and thrust-faulted with major structures and faults striking in a northeast-southwest direction.

Northwestward transport of the Paleozoic rock sequence along the thrust faults has resulted in the imbricate stacking of large slabs of rock referred to as thrust sheets. Within an individual thrust sheet, smaller faults may splay off the larger thrust fault, resulting in imbricate stacking of rock units within an individual thrust sheet (Osborne and Szabo, 1984). Geologic contacts in this region generally strike parallel to the faults and repetition of lithologic units is common in vertical sequences. Geologic formations within the Valley and Ridge Province portion of Calhoun County have been mapped by Warman and Causey (1962), Osborne and Szabo (1984), and Moser and DeJarnette (1992), and vary in age from Lower Cambrian to Pennsylvanian.

The basal unit of the sedimentary sequence in Calhoun County is the Cambrian Chilhowee Group. The Chilhowee Group is comprised of the Cochran, Nichols, Wilson Ridge, and Weisner Formations (Osborne and Szabo, 1984), but in Calhoun County is either undifferentiated or divided into the Cochran and Nichols Formations and an upper undifferentiated Wilson Ridge and Weisner Formation. The Cochran is composed of poorly sorted arkosic sandstone and

conglomerate with interbeds of greenish-gray siltstone and mudstone. Massive to laminated greenish-gray and black mudstone makes up the Nichols Formation with thin interbeds of siltstone and very fine-grained sandstone (Szabo et al., 1988). These two formations are mapped only in the eastern part of the county.

The Wilson Ridge and Weisner Formations are undifferentiated in Calhoun County and consist of both coarse-grained and fine-grained clastics. The coarse-grained facies appear to dominate the unit and consist primarily of coarse-grained, vitreous quartzite, and friable, fine- to coarse-grained, orthoquartzitic sandstone, both of which locally contain conglomerate. The fine-grained facies consist of sandy and micaceous shale and silty, micaceous mudstone which are locally interbedded with the coarse clastic rocks. The abundance of orthoquartzitic sandstone and quartzite suggests that most of the Chilhowee Group bedrock in the vicinity of FTMC belongs to the Weisner Formation (Osborne and Szabo, 1984).

The Cambrian Shady Dolomite overlies the Weisner Formation northeast, east, and southwest of the Main Post, and consists of interlayered bluish-gray or pale yellowish-gray sandy dolomitic limestone and siliceous dolomite with coarsely crystalline porous chert (Osborne et al., 1989). A variegated shale and clayey silt have been included within the lower part of the Shady Dolomite (Cloud, 1966). Material similar to this lower shale unit was noted in core holes drilled by the Alabama Geologic Survey on FTMC (Osborne and Szabo, 1984). The character of the Shady Dolomite in the FTMC vicinity and the true assignment of the shale at this stratigraphic interval are still uncertain (Osborne, 1999).

The Rome Formation overlies the Shady Dolomite and locally occurs to the northwest and southeast of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984), and immediately to the west of Reilly Airfield (Osborne and Szabo, 1984). The Rome Formation consists of variegated thinly interbedded grayish-red-purple mudstone, shale, siltstone, and greenish-red and light gray sandstone, with locally occurring limestone and dolomite. The Conasauga Formation overlies the Rome Formation and occurs along anticlinal axes in the northeastern portion of Pelham Range (Warman and Causey, 1962), (Osborne and Szabo, 1984) and the northern portion of the Main Post (Osborne et al., 1997). The Conasauga Formation is composed of dark-gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).

Overlying the Conasauga Formation is the Knox Group, which is composed of the Copper Ridge and Chepultepec dolomites of Cambro-Ordovician age. The Knox Group is undifferentiated in

Calhoun County and consists of light medium gray, fine to medium crystalline, variably bedded to laminated, siliceous dolomite and dolomitic limestone that weathers to a chert residuum (Osborne and Szabo, 1984). The Knox Group underlies a large portion of the Pelham Range area.

The Ordovician Newala and Little Oak Limestones overlie the Knox Group. The Newala Limestone consists of light to dark gray, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone is comprised of dark gray, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules. These limestone units are mapped together as undifferentiated at FTMC and other parts of Calhoun County. The Athens Shale overlies the Ordovician limestone units. The Athens Shale consists of dark-gray to black shale and graptolitic shale with localized interbedded dark gray limestone (Osborne et al., 1989). These units occur within an eroded “window” in the uppermost structural thrust sheet at FTMC and underlie much of the developed area of the Main Post.

Other Ordovician-aged bedrock units mapped in Calhoun County include the Greensport Formation, Colvin Mountain Sandstone, and Sequatchie Formation. These units consist of various siltstones, sandstones, shales, dolomites and limestones, and are mapped as one, undifferentiated unit in some areas of Calhoun County. The only Silurian-age sedimentary formation mapped in Calhoun County is the Red Mountain Formation. This unit consists of interbedded red sandstone, siltstone, and shale with greenish-gray to red silty and sandy limestone.

The Devonian Frog Mountain Sandstone consists of sandstone and quartzitic sandstone with shale interbeds, dolomudstone, and glauconitic limestone (Szabo et al., 1988). This unit locally occurs in the western portion of Pelham Range.

The Mississippian Fort Payne Chert and the Maury Formation overlie the Frog Mountain Sandstone and are composed of dark- to light-gray limestone with abundant chert nodules and greenish-gray to grayish-red phosphatic shale with increasing amounts of calcareous chert toward the upper portion of the formation (Osborne and Szabo, 1984). These units occur in the northwestern portion of Pelham Range. Overlying the Fort Payne Chert is the Floyd Shale, also of Mississippian age, which consists of thin-bedded, fissile brown to black shale with thin intercalated limestone layers and interbedded sandstone. Osborne and Szabo (1984) reassigned the Floyd Shale, which was mapped by Warman and Causey (1962) on the Main Post of FTMC,

to the Ordovician Athens Shale on the basis of fossil data.

The Jacksonville Thrust Fault is the most significant structural geologic feature in the vicinity of FTMC, both for its role in determining the stratigraphic relationships in the area and for its contribution to regional water supplies. The trace of the fault extends northeastward for approximately 39 miles between Bynum, Alabama and Piedmont, Alabama. The fault is interpreted as a major splay of the Pell City Fault (Osborne and Szabo, 1984). The Ordovician sequence comprising the Eden thrust sheet is exposed at FTMC through an eroded “window” or “fenster” in the overlying thrust sheet. Rocks within the window display complex folding with the folds being overturned, and tight to isoclinal. The carbonates and shales locally exhibit well-developed cleavage (Osborne and Szabo, 1984). The FTMC window is framed on the northwest by the Rome Formation, north by the Conasauga Formation, northeast, east, and southwest by the Shady Dolomite, and southeast and southwest by the Chilhowee Group (Osborne et al., 1997).

4.1.2 Site Geology

The soil type at the Former PDS at Building 3185 is Anniston and Allen gravelly loam, which is a friable, deep, strongly acid, well-drained soil that has developed in old local alluvium. This soil is formed either by erosional forces, surface runoff, or natural reworking processes. The surface horizon is usually a very dark-brown loam or dark grayish-brown sandy loam, while the subsoil is a dark-red, sandy clay loam. Sandstone and quartzite gravel and cobbles, as much as 8 inches in diameter, are on the surface and throughout the soil. The depth to bedrock is typically 2 feet bgs to greater than 10 feet bgs; however, bedrock was not encountered at any of the 5 borings installed at the site. Although erosion is a problem, this soil type can be productive in areas with little or no slope (U.S. Department of Agriculture, 1961).

Bedrock beneath the Former PDS at Building 3185 is mapped as the Mississippian Ordovician Floyd/Athens Shale undifferentiated (Osborne et al., 1997). These units occur within the eroded "window" in the uppermost structural thrust sheet at FTMC and underlie much of the developed areas on the Main Post.

A geologic cross section was constructed from direct-push and hollow-stem auger boring data collected during the SI, as shown on Figure 4-1. The geologic cross-section location is shown on Figure 3-1. Based on the cross section, residuum beneath the Former PDS at Building 3185 consists of predominantly silty sand and clayey sand and inorganic clays of low to high plasticity. Inorganic clays of high plasticity typically occurred within the saturated zone. Poorly sorted

sand and quartzite gravel occurred throughout the unsaturated zone. Bedrock was not encountered during SI activities at the Former PDS at Building 3185.

4.2 Site Hydrology

4.2.1 Surface Hydrology

Precipitation in the form of rainfall averages about 54 inches annually in Anniston, Alabama, with infiltration rates annually exceeding evapotranspiration rates (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1998). The major surface water features on the Main Post of FTMC include Remount Creek, Cane Creek, South Branch of Cane Creek, and Cave Creek. These waterways flow in a general northwest to westerly direction towards the Coosa River on the western boundary of Calhoun County.

Surface runoff at the Former PDS at Building 3185 follows site topography and generally flows to the northeast toward a tributary of South Branch of Cane Creek located approximately 300 feet east of the parcel.

4.2.2 Hydrogeology

Static groundwater levels were measured in monitoring wells at the Former PDS at Building 3185 on March 14, 2000. Table 3-4 summarizes the measured groundwater elevations. Figure 4-2 is a groundwater elevation contour map constructed from the March 2000 data.

Based on the March 2000 groundwater elevation data, groundwater flow at the site is to the northeast (Figure 4-2). The average hydraulic gradient across the site is approximately 0.03 feet per foot. During boring and well installation activities, groundwater was encountered within the residuum at depths ranging from 22 to 25.5 feet bgs. Static groundwater levels measured on March 14, 2000 are approximately 5 to 11 feet above the depth to water encountered during well installation activities. This indicates that the groundwater has an upward hydraulic gradient and is under semiconfined conditions.

5.0 Summary of Analytical Results

The results of the chemical analyses of samples collected at the Former PDS at Building 3185, Parcel 179(7), indicate that VOCs and SVOCs have been detected in the various site media. CWM breakdown products were not detected in the one surface soil sample (PPMP-179-GP05) for which these constituents were analyzed. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC.

SVOC concentrations in surface soils that exceeded the SSSLs and ESVs were compared to PAH background screening values, where available. The PAH background screening values were derived from PAH analytical data from 18 parcels at FTMC that were determined to represent anthropogenic activity (IT, 2000b). PAH background screening values were developed for 2 categories of surface soils: beneath asphalt and adjacent to asphalt. The PAH background screening values for soils adjacent to asphalt are more conservative PAH background values (i.e., lower) and are the values used herein for comparison.

Six compounds were quantified by both SW-846 Method 8260B (VOCs) and Method 8270C (SVOCs), including 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 1,3-dichlorobenzene, 1,2-dichlorobenzene, hexachlorobutadiene, and naphthalene. Method 8260B yields a reporting limit (RL) of 0.005 milligrams per kilogram (mg/kg), while Method 8270C has a RL of 0.330 mg/kg, which is typical for a soil matrix sample. Because of the direct nature of the Method 8260B analysis and its resulting lower RL, this method should be considered superior to Method 8270C when quantifying low levels (0.005 to 0.330 mg/kg) of these compounds. Method 8270C and its associated methylene chloride extraction step is superior, however, when dealing with samples that contain higher concentrations (greater than 0.330 mg/kg) of these compounds. Therefore, all data were considered and none were categorically excluded. Data validation qualifiers were helpful in evaluating the usability of data, especially if calibration, blank contamination, precision, or accuracy indicator anomalies were encountered. The validation qualifiers and concentrations reported (e.g., whether concentrations were less than or greater than 0.330 mg/kg) were used to determine which analytical method was likely to return the more accurate result.

The following sections and Tables 5-1 through 5-3 summarize the results of the comparison of

detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical results are presented in Appendix E.

5.1 Surface Soil Analytical Results

Five surface soil samples were collected for chemical analyses at the Former PDS at Building 3185, Parcel 179(7). Surface soil samples were collected from the upper 1 foot of soil at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, ESVs, and PAH background screening values, as presented in Table 5-1.

Volatile Organic Compounds. Four VOCs, including acetone, bromomethane, methylene chloride, and toluene, were detected in surface soil samples collected at the Former PDS at Building 3185. The acetone, bromomethane, and methylene chloride results were flagged with either a “B” data qualifier signifying that these compounds were also detected in an associated laboratory or field blank, or with a “J” data qualifier signifying that the result was greater than the method detection limit but less than the RL. Typically, these compounds are common laboratory contaminants, especially when detected at very low levels.

The VOC concentrations in surface soils were below SSSLs and ESVs.

Semivolatile Organic Compounds. Twenty-one SVOCs, including sixteen PAH compounds and five non-PAH compounds, were detected in surface soil samples collected at the Former PDS at Building 3185. Sample locations PPMP-179-GP01 and PPMP-179-GP02 contained twenty-one and nineteen SVOCs, respectively, of the twenty-one detected SVOCs. SVOCs were not detected at two sample locations (PPMP-179-GP03 and PPMP-179-GP04); di-n-butyl phthalate and bis(2-ethylhexyl)phthalate were the only detected SVOCs at sample location PPMP-179-GP05.

The concentration of five PAH compounds, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, exceeded SSSLs and PAH background values at sample location PPMP-179-GP01. In addition, the concentration of benzo(a)anthracene exceeded the SSSL and PAH background value at PPMP-179-GP02. The PAH concentrations at sample locations PPMP-179-GP01 and PPMP-179-GP02 ranged from 0.041 mg/kg to 8.3 mg/kg. The concentrations of the non-PAH compounds (2-methylnaphthalene, carbazole, di-n-butylphthalate, dibenzofuran, and bis[2-ethylhexyl]phthalate) were below SSSLs.

Table 5-1

Surface Soil Analytical Results
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					PPMP-179 PPMP-179-GP01 KH0001 29-Jan-99 0- 1					PPMP-179 PPMP-179-GP02 KH0003 15-Jan-99 0- 1					PPMP-179 PPMP-179-GP03 KH0005 15-Jan-99 0- 1				
Parameter	Units	BKG ^a	SSSL ^b	ESV ^b	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/kg	NA	7.76E+02	2.50E+00	ND					2.00E-02	B				9.60E-03	B			
Bromomethane	mg/kg	NA	1.09E+01	NA	ND					1.70E-03	B				2.20E-03	B			
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	2.70E-03	B				2.80E-03	B				3.80E-03	B			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					ND				
SEMIVOLATILE ORGANIC COMPOUNDS																			
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	8.10E-02	J				ND					ND				
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	6.70E-01					2.10E-01	J				ND				
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	4.60E-02	J				ND					ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	1.10E+00		YES		YES	4.10E-01				YES	ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	3.70E+00		YES	YES		1.30E+00		YES	YES		ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	2.60E+00		YES	YES	YES	1.30E+00			YES	YES	ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	3.60E+00		YES	YES		1.10E+00			YES		ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	1.90E+00		YES			8.40E-01					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	2.50E+00		YES			1.30E+00					ND				
Carbazole	mg/kg	NA	3.11E+01	NA	1.10E+00					4.20E-01					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	3.40E+00		YES			1.50E+00		YES			ND				
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	2.00E+02	1.00E-01	J				8.70E-02	B				ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	9.80E-01		YES	YES		3.40E-01	J		YES		ND				
Dibenzofuran	mg/kg	NA	3.09E+01	NA	2.00E-01	J				5.10E-02	J				ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	8.30E+00	D	YES		YES	3.40E+00		YES		YES	ND				
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	4.90E-01					1.50E-01	J				ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	1.70E+00		YES	YES		7.30E-01					ND				
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	1.80E-01	J	YES		YES	4.10E-02	J	YES			ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	5.70E+00		YES		YES	2.00E+00		YES		YES	ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	6.10E+00		YES		YES	2.80E+00		YES		YES	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	1.10E-01	J				1.10E-01	B				ND				

Table 5-1

Surface Soil Analytical Results
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 2)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					PPMP-179 PPMP-179-GP04 KH0007 18-Jan-99 0- 1					PPMP-179 PPMP-179-GP05 KH0011 15-Jan-99 0- 1				
Parameter	Units	BKG ^a	SSSL ^b	ESV ^b	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
VOLATILE ORGANIC COMPOUNDS														
Acetone	mg/kg	NA	7.76E+02	2.50E+00	3.70E-02	J				7.00E-03	B			
Bromomethane	mg/kg	NA	1.09E+01	NA	9.70E-03	J				1.60E-03	B			
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	1.60E-02	B				2.90E-03	B			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					1.50E-02				
SEMIVOLATILE ORGANIC COMPOUNDS														
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	ND					ND				
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	ND					ND				
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	ND					ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND					ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					ND				
Carbazole	mg/kg	NA	3.11E+01	NA	ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND					ND				
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	2.00E+02	ND					1.00E-01	B			
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					ND				
Dibenzofuran	mg/kg	NA	3.09E+01	NA	ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	ND					ND				
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					ND				
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	ND					ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND					8.50E-02	B			

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

^a BKG - Background. Value listed is the background screening value for soils adjacent to asphalt as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

^b Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than method detection limit but less than or equal to reporting limit.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 5-2

Subsurface Soil Analytical Results
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)			PPMP-179 PPMP-179-GP01 KH0002 29-Jan-99 6-9			PPMP-179 PPMP-179-GP02 KH0004 15-Jan-99 3 - 4.5			PPMP-179 PPMP-179-GP03 KH0006 15-Jan-99 6-9			PPMP-179 PPMP-179-GP04 KH0010 18-Jan-99 2-4			PPMP-179 PPMP-179-GP05 KH0012 15-Jan-99 3-5		
Parameter	Units	SSSL ^a	Result	Qual	>SSSL	Result	Qual	>SSSL	Result	Qual	>SSSL	Result	Qual	>SSSL	Result	Qual	>SSSL
VOLATILE ORGANIC COMPOUNDS																	
Acetone	mg/kg	7.76E+02	8.10E-03	J		2.00E-01	J		1.20E-02	B		1.70E-01	J		5.10E-01	J	
Bromomethane	mg/kg	1.09E+01	ND			1.90E-03	B		1.70E-03	B		1.20E-02	J		1.60E-03	B	
Methylene chloride	mg/kg	8.41E+01	2.90E-03	B		3.00E-03	B		3.90E-03	B		2.00E-02	B		2.70E-03	B	
SEMIVOLATILE ORGANIC COMPOUNDS																	
Anthracene	mg/kg	2.33E+03	8.60E-02	J		ND			ND			ND			ND		
Benzo(a)anthracene	mg/kg	8.51E-01	5.10E-02	J		ND			ND			ND			ND		
Chrysene	mg/kg	8.61E+01	8.00E-02	J		ND			ND			ND			ND		
Di-n-butyl phthalate	mg/kg	7.80E+02	ND			1.10E-01	B		9.50E-02	B		ND			8.60E-02	B	
Dibenzofuran	mg/kg	3.09E+01	9.10E-02	J		ND			ND			ND			ND		
Fluorene	mg/kg	3.09E+02	4.80E-02	J		ND			ND			ND			ND		
Phenanthrene	mg/kg	2.32E+03	1.10E+00			ND			ND			ND			ND		
bis(2-Ethylhexyl)phthalate	mg/kg	4.52E+01	ND			7.80E-02	B		7.10E-02	B		ND			6.30E-02	B	

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

^a Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than method detection limit but less than or equal to reporting limit.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 5-3

Groundwater Analytical Results
Former Personnel Decontamination Station at Building 3185, Parcel 179(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date			PPMP-179 PPMP-179-GP02 KH3001 23-Feb-99			PPMP-179 PPMP-179-GP04 KH3004 23-Feb-99			PPMP-179 PPMP-179-GP05 KH3005 23-Feb-99		
Parameter	Units	SSSL ^a	Result	Qual	>SSSL	Result	Qual	>SSSL	Result	Qual	>SSSL
VOLATILE ORGANIC COMPOUNDS											
Acetone	mg/L	1.56E-01	3.70E-03	B		ND			3.50E-03	B	
Chloroform	mg/L	1.15E-03	5.80E-04	B		ND			4.50E-04	B	
Trichloroethene	mg/L	4.50E-03	1.90E-03	J		ND			1.50E-03		

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

^a Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than method detection limit but less than or equal to reporting limit.

mg/L - Milligrams per liter.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Six PAH compounds, including anthracene, benzo(a)pyrene, fluoranthene, naphthalene, phenanthrene, and pyrene, were detected at concentrations exceeding ESVs and PAH background values at sample locations PPMP-179-GP01 and/or PPMP-179-GP02.

5.2 Subsurface Soil Analytical Results

Five subsurface soil samples were collected for chemical analyses at the Former PDS at Building 3185, Parcel 179(7). Subsurface soil samples were collected at depths ranging from 2 to 9 feet bgs at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, as presented in Table 5-2.

Volatile Organic Compounds. Three VOCs, including acetone, bromomethane, and methylene chloride, were detected in subsurface soil samples collected at the Former PDS at Building 3185. The bromomethane, methylene chloride, and one of the acetone results were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank. Typically, these compounds are common laboratory contaminants, especially when detected at very low levels.

The VOC concentrations in subsurface soils were below SSSLs.

Semivolatile Organic Compounds. Eight SVOCs were detected in subsurface soil samples collected at the Former PDS at Building 3185. The di-n-butyl phthalate and bis(2-ethylhexyl)phthalate results were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank. Six of the eight detected SVOCs were present in the sample collected at PPMP-179-GP01. Di-n-butyl phthalate and bis(2-ethylhexyl)phthalate were the only detected SVOCs at three sample locations (PPMP-179-GP02, PPMP-179-GP03, and PPMP-179-GP05). SVOCs were not detected at sample location PPMP-179-GP04.

The SVOC concentrations in subsurface soils were below SSSLs.

5.3 Groundwater Analytical Results

Three temporary monitoring wells were sampled at the Former PDS at Building 3185, Parcel 179(7), at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, as presented in Table 5-3.

Volatile Organic Compounds. Three VOCs, including acetone, chloroform, and trichloroethene (TCE), were detected in two of the groundwater samples collected at the Former PDS at Building 3185 (PPMP-179-GP02 and PPMP-179-GP05). The acetone and chloroform results were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank. The TCE was detected at a concentration of 0.0019 milligrams per liter (mg/L) and 0.0015 mg/L, well below the SSSL of 0.0045 mg/L. VOCs were not detected in the sample collected at PPMP-179-GP04. The VOC concentrations in groundwater were below SSSLs.

Semivolatile Organic Compounds. SVOCs were not detected in the groundwater samples collected at the Former PDS at Building 3185.

6.0 Summary and Conclusions and Recommendations

IT, under contract with USACE, completed an SI at the Former PDS at Building 3185, Parcel 179(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site at concentrations that would present an unacceptable risk to human health or the environment. The SI at the Former PDS at Building 3185, Parcel 179(7), consisted of the sampling and analyses of five surface soil samples, five subsurface soil samples, and three groundwater samples. In addition, three temporary monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and provide site-specific geological and hydrogeological characterization information.

Chemical analyses of samples collected at the Former PDS at Building 3185, Parcel 179(7), indicate that VOCs and SVOCs were detected in the various site media. CWM products were not detected in the surface soil sample for which these constituents were analyzed. Analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC. Additionally, SVOC concentrations exceeding SSSLs and ESVs in surface soils were compared to PAH background screening values (IT, 2000b).

The potential threat to human receptors is expected to be low. Although the site is projected for industrial (mixed business) use, the analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future land use. A total of five SVOCs (PAH compounds) were detected in two surface soil samples (PPMP-179-GP01 and PPMP-179-GP02) at concentrations exceeding SSSLs and PAH background values. The PAH concentrations in the two samples ranged from 0.041 mg/kg to 8.3 mg/kg. Based on the spatial distribution and the low concentrations detected, the elevated PAHs appear to be the result of anthropogenic activities (e.g., asphalt) and not related to site operations.

A total of six SVOCs (PAH compounds) were detected in two surface soil samples at concentrations exceeding ESVs and PAH background values. However, the potential impact to ecological receptors is expected to be minimal based on site conditions. Much of the site is covered by Building 3185 and asphalt or concrete pavement; grassy areas are limited. The site does not currently support viable ecological habitat and is not expected to support ecological habitat in the projected (industrial) land-use scenario.

Based on the results of the SI, past operations at the Former PDS at Building 3185, Parcel 179(7), do not appear to have adversely impacted the environment. The chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. Therefore, IT recommends “No Further Action” and unrestricted reuse with regard to hazardous, toxic, and radioactive waste at the Former PDS at Building 3185, Parcel 179(7).

7.0 References

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ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

APPENDIX A

**SAMPLE COLLECTION LOGS AND
ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS**

SAMPLE COLLECTION LOGS

ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS

APPENDIX B

BORING LOGS AND WELL CONSTRUCTION LOGS

BORING LOGS

WELL CONSTRUCTION LOGS

APPENDIX C

WELL DEVELOPMENT LOGS

APPENDIX D

SURVEY DATA

Appendix D

Survey Data

Former Personnel Decontamination Station at Building 3185, Parcel 179(7) Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft msl)	Top of Casing Elevation (ft msl)
PPMP-179-GP01	1166298.32	668478.31	815.47	NA
PPMP-179-GP02	1166293.37	668538.99	815.10	815.95
PPMP-179-GP03	1166145.57	668479.92	817.65	NA
PPMP-179-GP04	1166030.61	668586.55	819.47	820.71
PPMP-179-GP05	1166013.49	668502.75	821.70	823.11

Horizontal coordinates referenced to the U.S. State Plane Coordinate System,
Alabama East Zone, North American Datum (NAD83), 1983

Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

ft msl - Feet mean sea level

NA - Not applicable.

APPENDIX E

SUMMARY OF VALIDATED ANALYTICAL DATA

APPENDIX F

DATA VALIDATION SUMMARY REPORT